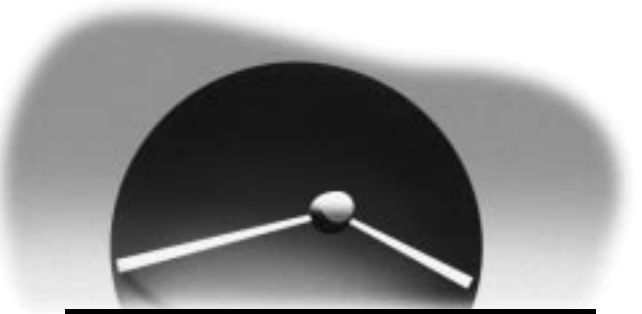
Modern inventory management looks as much to quick response to provide materiel when requested as it does to buying and holding in anticipation of demand. Particularly when items are low-cost, are stable in demand, and can be procured quickly, the practice is to carry as little inventory as possible. Modern variants of the "just-in-time" principle allow managers to treat the holding of inventory as a last resort. Supporting advanced military systems, however, poses unique problems, which will be discussed in this brochure.

A modern warplane contains many components that are designed to be removed from the aircraft and replaced when they fail. Many of these components — such as brake assemblies, avionics units, and engine fuel controls — are expensive enough to warrant repair in their own right. Spares for these reparable components are needed to keep the aircraft ready to fly while the failed unit is being repaired. The typical low operating tempo and small fleet sizes of military aircraft (or similar end items) lead to sporadic and unstable demand patterns; the specialized nature of many components leads to small market size and to procurement lead-times that can stretch into years. These two factors limit the utility of some of the newer practices and argue in favor of large inventories to ensure support of the end items. Yet, when unit costs can exceed $1 million, the necessity to control inventories is obvious.

The Aircraft Sustainability Model sizes the spares inventory on the basis of desired readiness levels.

Military materiel management, then, must use as much of modern commercial practice as is practicable so that spares can be repaired and shipped quickly. But these methods do not eliminate the need to forecast requirements and make the best inventory decisions possible.



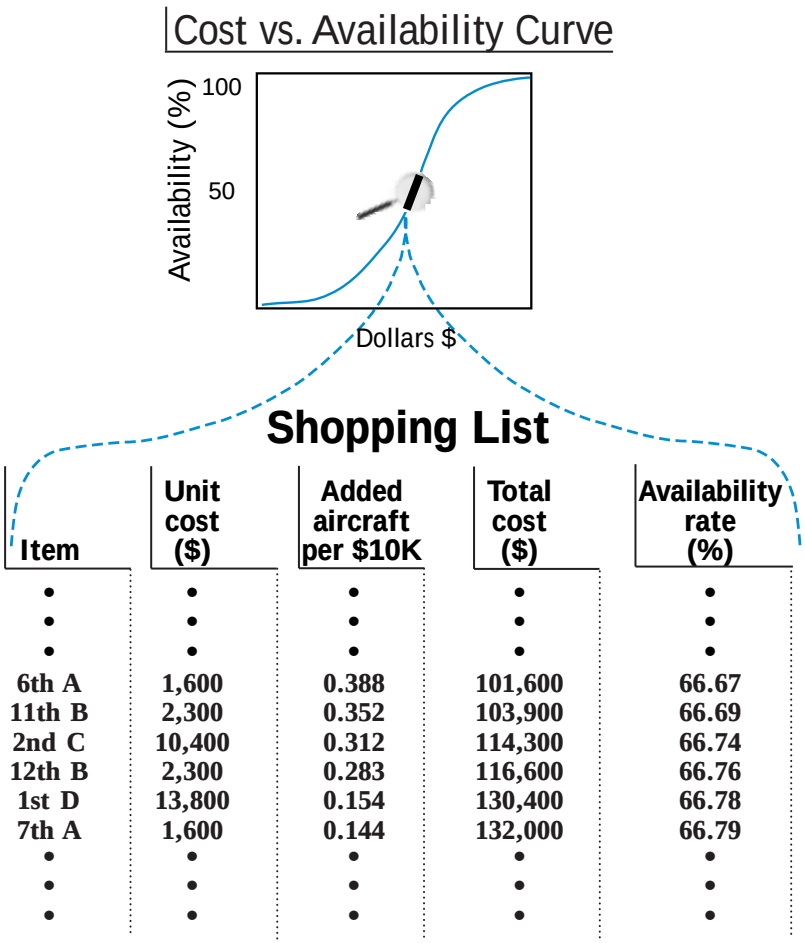
The ASM's greater efficiency over traditional methods can lead to savings of up to 25 percent in spares inventory.

The Aircraft Sustainability Model (ASM), originally developed by the Logistics Management Institute for the United States Air Force (USAF), computes optimal spares mixes to support a wide range of possible operating scenarios. The ASM sizes the spares inventory explicitly on the basis of desired weapon system readiness levels, such as aircraft availability — the percentage of the fleet ready to fly a mission — rather than supply-oriented measures, such as stock on shelf or percentage of demands filled.

The ASM is used by the USAF to determine spares kits to support wartime deployments and has been specially enhanced for the initial provisioning process. The USAF uses it for initial provisioning for the F-22 Advanced Tactical Fighter and the E-8 Joint Surveillance Target Attack Radar System (JSTARS), and it has been proposed as a Defense Department standard.

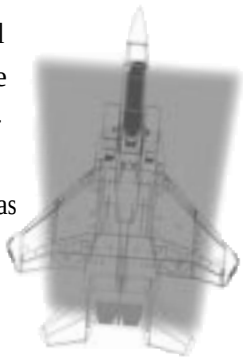
The ASM resides on a personal computer (PC) platform with a graphic user interface and an integrated database management system to aid user analyses. It can accommodate a wide range of support system and aircraft operating characteristics, including the supply and maintenance system echelon structure, the aircraft indenture structure, cannibalization, and flying profiles, all of which can vary over time.

The ASM uses the typical component data — demand rates, repair times, unit cost, and so on — in conjunction with any of a wide range of operating scenarios. It then uses a marginal analysis approach, ranking possible additions to the inventory in terms of their probable benefit to aircraft availability divided by their procurement cost. Spares with the greatest benefit per dollar appear at the top of this "shopping list," guaranteeing that the spares mix is optimal. Accumulated costs and resulting aircraft availability are tracked as the shopping list is formed to provide a curve relating overall funding to projected availability. The curve can be used by logistics planners to formulate budgets and allocate resources. On the compo-

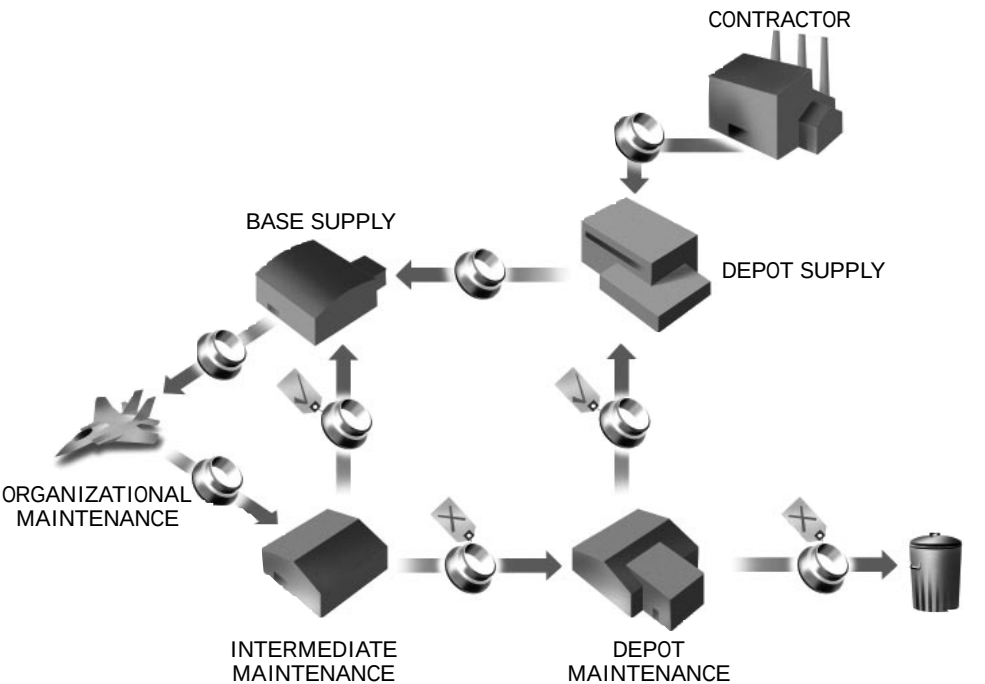


nent level, item managers can use the shopping list to determine detailed buy requirements consistent with those aggregate funding decisions.

The ASM is the state of the art in spares requirement models. It is highly capable, yet user-friendly. Its basic principles have been proven in use by the USAF, the National Aeronautics and Space Administration International Space Station Program, and the Israel Air Force. The ASM's efficient spares mix can provide the same level of support as traditional methods while reducing spares inventories by as much as 25 percent.



ROTATING FLOW OF SPARES



mission

The mission of the **Logistics Management Institute** is to provide senior National Security and other government officials with advice across the spectrum of logistics and acquisition issues.

AS A NONPROFIT ORGANIZATION, THE INSTITUTE is committed to excellence in giving practical, innovative, and objective counsel, free of commercial or political interest.

In 1961, with Presidential approval, the Logistics Management Institute was founded to improve business management in the Department of Defense. Today, we prepare analyses and provide management advice relating to a wide range of acquisition and logistics matters for sponsoring organizations in civil government agencies and nonprofit corporations as well. We operate a Federally Funded Research and Development Center and a separate Center for Public Administration that is designed to meet the needs of civil agencies. In both centers, we offer the same type of technical and analytical support and the same long-term relationship, free from conflicts of interest.